DOE/NV--1151

Nevada
Environmental
Restoration
Project

National Nuclear Security Administration

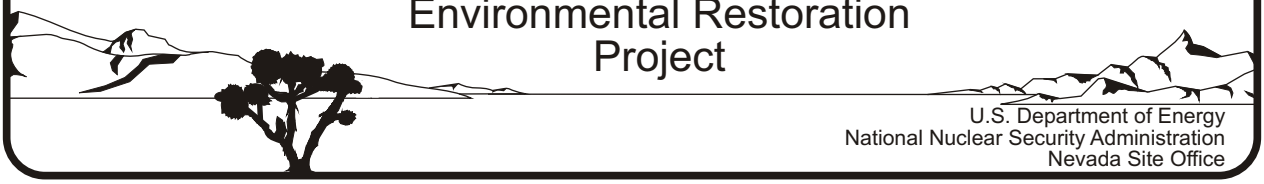
Post-Closure Inspection and Monitoring Report for Corrective Action Unit 342: Area 23 Mercury Fire Training Pit, Nevada Test Site, Nevada

For Calendar Years 2004-2005

Controlled Copy No.:_____

Revision: 0

August 2006



Environmental Restoration
Project

U.S. Department of Energy
National Nuclear Security Administration
Nevada Site Office

DISCLAIMER

DOE/NV--1151

POST-CLOSURE INSPECTION AND MONITORING REPORT FOR CORRECTIVE ACTION UNIT 342: AREA 23 MERCURY FIRE TRAINING PIT, NEVADA TEST SITE, NEVADA

FOR CALENDAR YEARS 2004-2005

U.S. Department of Energy
National Nuclear Security Administration
Nevada Site Office
Las Vegas, Nevada

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POST-CLOSURE INSPECTION AND MONITORING REPORT FOR CORRECTIVE ACTION UNIT 342: AREA 23 MERCURY FIRE TRAINING PIT, NEVADA TEST SITE, NEVADA

FOR CALENDAR YEARS 2004-2005

Approved By: SIGNATURE APPROVED Date: 8/10/06
Kevin J. Cabble
Federal Sub-Project Director
Environmental Restoration Project

Approved By: SIGNATURE APPROVED Date: 8/15/06

Janet L. Appenzeller-Wing
Federal Project Director
Environmental Restoration Project

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ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
CAU	Corrective Action Unit
CR	Closure Report
DOE/NV	U.S. Department of Energy, Nevada Operations Office (used prior to April 2001)
EPA	U.S. Environmental Protection Agency
FFACO	*Federal Facility Agreement and Consent Order*
ft	foot (feet)
GC	gas chromatograph
IR	infrared
m	meter(s)
ND	not detected
NDEP	Nevada Division of Environmental Protection
NTS	Nevada Test Site
QA	quality assurance
QC	quality control
SVOC	semivolatile organic compound
TPH	total petroleum hydrocarbons
VOC	volatile organic compound

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EXECUTIVE SUMMARY

This report provides a summary and analysis of visual site inspections and soil gas sampling results for Corrective Action Unit (CAU) 342, Area 23 Mercury Fire Training Pit. CAU 342 is identified in the *Federal Facility Agreement and Consent Order* of 1996 and consists of Corrective Action Site 23-56-01, Former Mercury Fire Training Pit. This report covers calendar years 2004 and 2005.

Visual site inspections were conducted on May 20 and November 14, 2004, and May 17 and November 15, 2005. No significant findings were observed during these inspections. The site was in good condition, and no repair activities were required.

Soil gas samples were collected on November 29, 2005, for analysis of volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs), and samples were collected on December 1, 2005, for analysis of base gases. Base gas concentrations in the monitoring well show a high concentration of carbon dioxide and a low concentration of oxygen, which is an indication of biodegradation of total petroleum hydrocarbons (TPH) in the soil. Results for VOCs and SVOCs are unchanged, with VOCs below or near laboratory method detection limits and no SVOCs detected above laboratory method detection limits.

Post-closure monitoring was required for six years after closure of the site. Therefore, since 2005 was the sixth year of monitoring, the effectiveness of natural attenuation of the TPH-impacted soil by biodegradation was evaluated. The base gas concentrations indicate that biodegradation of TPH in the soil is occurring; therefore, it is recommended that monitoring be discontinued. Visual site inspections should continue to be performed biannually to ensure that the signs are in place and readable and that the use restriction has been maintained. The results of the site inspections will be documented in a letter report and submitted annually.

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1.0 INTRODUCTION

This report provides a summary and analysis of visual site inspections and soil gas sampling results for Corrective Action Unit (CAU) 342, Area 23 Mercury Fire Training Pit, which is located in Area 23 of the Nevada Test Site (NTS) in Nye County, Nevada (Figure 1). CAU 342 is identified in the *Federal Facility Agreement and Consent Order* (FFACO) of 1996 and consists of Corrective Action Site 23-56-01, Former Mercury Fire Training Pit (FFACO, 1996). The site layout is presented in Figure 2. This report covers calendar years 2004 and 2005.

1.1 SCOPE AND OBJECTIVES

As specified in the Closure Report (CR) for CAU 342, post-closure monitoring includes biannual (once every six months) visual site inspections and biennial (once every two years) soil gas sampling (U.S. Department of Energy, Nevada Operations Office [DOE/NV], 2000).

Visual site inspections are conducted to document the physical condition of the site and the soil gas monitoring well, to verify that the use restriction has been maintained, and to note any unusual conditions that could affect the site. The results of the inspections are documented on a post-closure inspection form. Copies of the post-closure inspection forms for 2004 and 2005 are included as Appendix A of this report.

Soil gas samples are collected and analyzed to determine whether the total petroleum hydrocarbon (TPH) remaining in the soil is undergoing natural biodegradation. Concentrations of base gases, volatile organic compounds (VOCs), and semivolatile organic compounds (SVOCs) are indicators of TPH biodegradation. Soil gas samples are collected and analyzed in the field for base gases (oxygen, nitrogen, carbon dioxide, methane, and carbon monoxide), and shipped to an offsite laboratory for analysis of VOCs and SVOCs. The laboratory analytical result summaries are included as Appendix B of this report.

1.2 BACKGROUND

Closure activities were conducted in October and November of 1999 and are documented in the approved CR for CAU 342 (DOE/NV, 2000). Closure activities included removing debris, excavating approximately 1,150 cubic meters (1,500 cubic yards) of TPH-impacted soil, installing a soil gas monitoring well, fencing and posting the site, and implementing a use restriction. TPH-impacted soil was excavated to approximately 1.5 meters (m) (5 feet [ft]) below ground surface (bgs), and the excavations were backfilled with clean soil. TPH-impacted soil deeper than 1.5 m (5 ft) bgs was left in place. The soil gas monitoring well extends to 6.7 m (22 ft) bgs.

1.3 GEOLOGIC SETTING

CAU 342 lies within the Mercury Valley and is underlain by unconsolidated alluvium derived from the Specter, Red Mountain, and Mercury Ranges. These ranges consist of Paleozoic

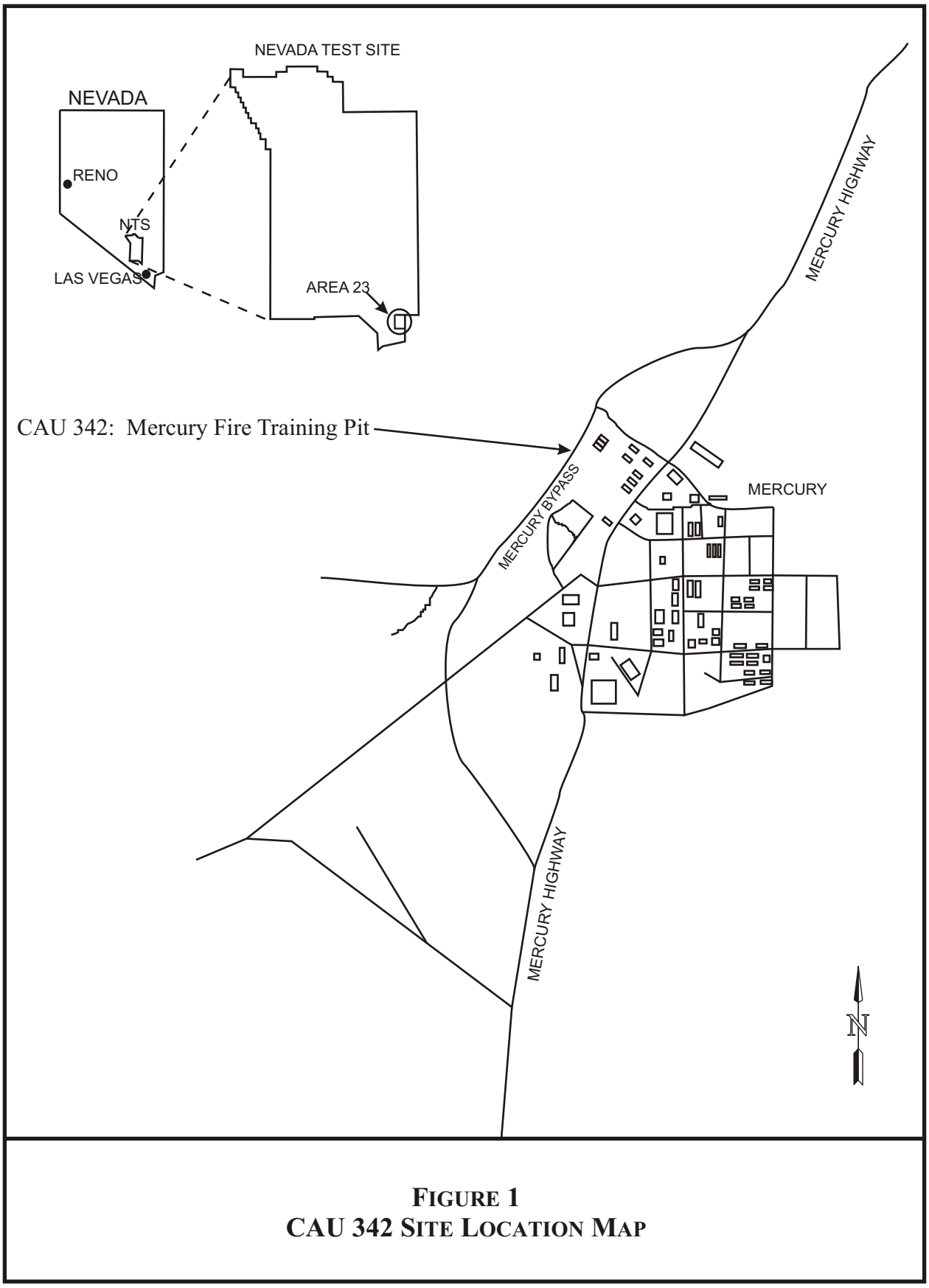

FIGURE 1
CAU 342 SITE LOCATION MAP

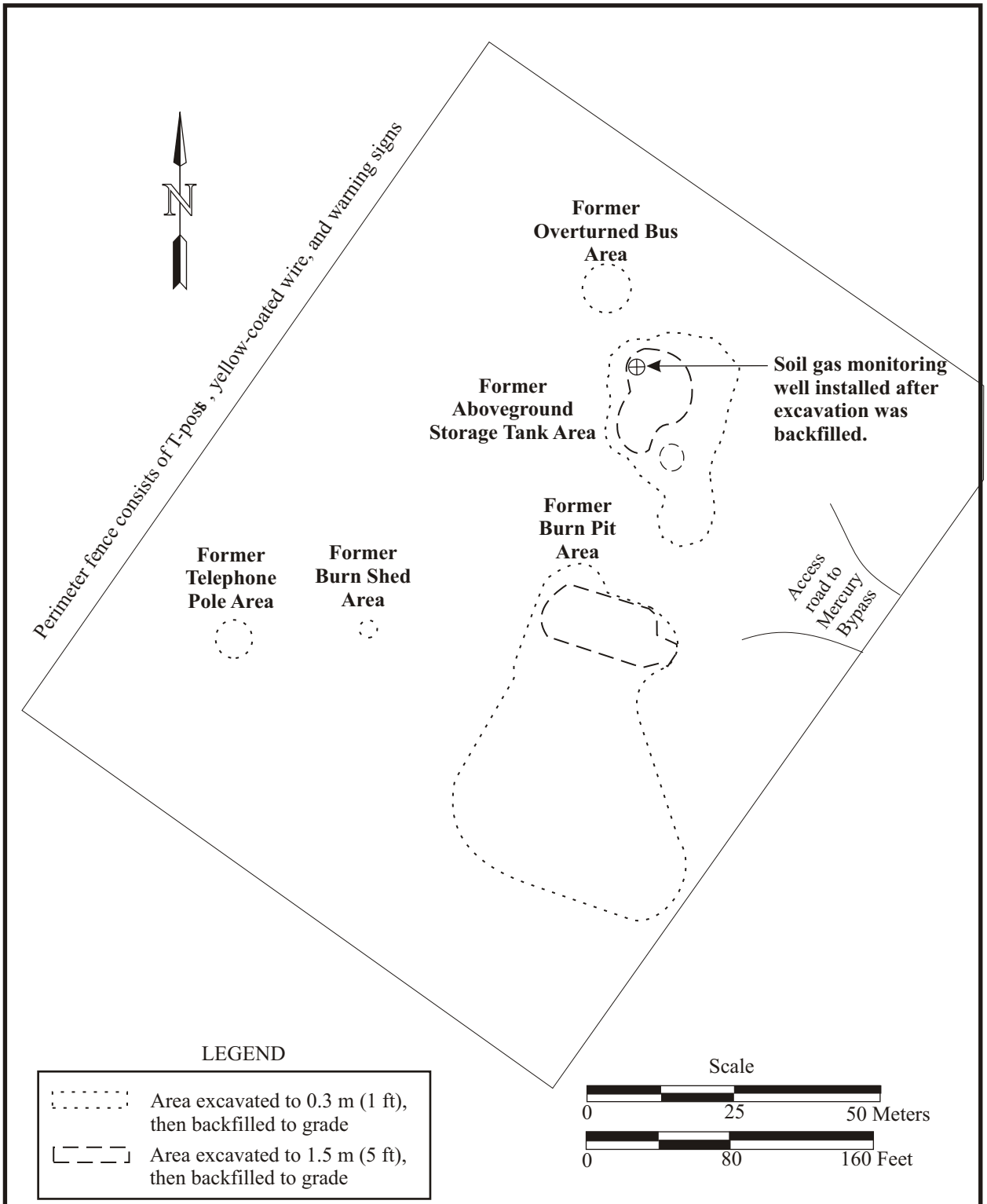

FIGURE 2
CAU 342 SITE LAYOUT

carbonate rocks and quartzite. The near-surface alluvium is composed of silty sand with abundant gravel and cobbles. Some boulders up to 0.9 m (3 ft) in diameter have been noted. Localized caliche formation is present near the surface.

Groundwater at the NTS is conveyed within the Ash Meadows hydrologic subbasin. This subbasin is part of an interbasin flow system within the regional carbonate aquifer and is relatively independent of the topographic boundaries. The Ash Meadows hydrologic subbasin beneath CAU 342 occupies the lower Cenozoic alluvial fill. The groundwater table is estimated to be about 244 to 335 m (800 to 1,100 ft) bgs, with flow to the southwest (Winograd et al., 1975). The nearest water well is located approximately 5.6 kilometers (3.5 miles) to the southwest, at Army Well Number 1.

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2.0 POST-CLOSURE MONITORING REQUIREMENTS

2.1 BACKGROUND

The CAU 342 post-closure plan consists of biannual (once every 6 months) site inspections and biennial (once every two years) soil gas monitoring. The site inspections will document the condition of the site and determine if repairs, additional backfilling, or more effective use restrictions are needed. Additional nonscheduled inspections may be required after severe weather events such as flash flooding or high winds. Identified maintenance and repair requirements will be remedied within 90 days of discovery and documented in writing at the time of repair.

2.2 SITE INSPECTIONS

Visual site inspections of CAU 342 were conducted on May 20 and November 14, 2004, and on May 17 and November 15, 2005. No additional nonscheduled inspections were required during 2004 and 2005. Results of each inspection are documented on a post-closure inspection form. Copies of the post-closure inspection forms for 2004 and 2005 and photographs taken during site inspections to document the site conditions are included as Appendix A of this report.

2.3 SOIL GAS MONITORING

The soil gas monitoring will determine if the remaining TPH is undergoing natural biodegradation. Soil gas samples will be submitted to a qualified laboratory for analysis of VOCs and SVOCs. In addition, the soil gas will be field-screened for oxygen, carbon dioxide, methane, and VOCs using a micro gas chromatograph (GC) or similar instrument.

Sampling will continue for six years (an initial sampling event followed by three biennial sampling events). If after six years the analytical results show that natural attenuation is decreasing TPH levels in the soil, monitoring will be discontinued. If levels are not shown to be decreasing after six years, a determination will be made by the National Nuclear Security Administration and the Nevada Division of Environmental Protection (NDEP) as to how to proceed.

2.4 COMPLIANCE CRITERIA

Compliance criteria have not been established for this site.

2.5 REPORTING REQUIREMENTS

A report will be prepared following each biennial soil gas monitoring event. The biennial report will include completed post-closure inspection forms, repair records (if any), soil gas analytical results and discussion, and recommendations. A copy of each biennial report will be submitted to the NDEP.

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3.0 SITE INSPECTIONS AND MAINTENANCE

Visual site inspections of CAU 342 were conducted on May 20 and November 14, 2004, and on May 17 and November 15, 2005. Results of each inspection are documented on a post-closure inspection form. Copies of the post-closure inspection forms for 2004 and 2005 and photographs taken during site inspections to document the site conditions are included as Appendix A of this report.

3.1 SITE INSPECTION RESULTS

3.1.1 May 20, 2004, Site Inspection

The monitoring well and cover, fencing, signs, and fenced area were in excellent condition. No issues or concerns were identified, and no maintenance or repair was required.

3.1.2 November 14, 2004, Site Inspection

The monitoring well and cover, fencing, signs, and fenced area were in excellent condition. No issues or concerns were identified, and no maintenance or repair was required.

3.1.3 May 17, 2005, Site Inspection

The monitoring well and cover, fencing, signs, and fenced area were in excellent condition. No issues or concerns were identified, and no maintenance or repair was required.

3.1.4 November 15, 2005, Site Inspection

The monitoring well and cover, fencing, signs, and fenced area were in excellent condition. No issues or concerns were identified, and no maintenance or repair was required.

3.2 MAINTENANCE AND REPAIR

No maintenance or repair was required in 2004 and 2005.

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4.0 SOIL GAS MONITORING

Soil gas samples were collected on November 29, 2005, for analysis of VOCs and SVOCs, and samples were collected on December 1, 2005, for analysis of base gases. The laboratory analytical result summaries are included as Appendix B of this report.

4.1 SOIL GAS SAMPLE COLLECTION

Analytical data collected in September of 2000 and February of 2001 form the baseline data set used for comparison of results for later sampling events. Soil gas samples are collected biennially (once every two years) to determine the effectiveness of natural biodegradation of the TPH remaining in the soil. Table 1 lists the soil gas sampling events through 2005.

TABLE 1. SOIL GAS SAMPLING EVENTS

SAMPLE NUMBER	SAMPLE DATE	TYPE OF ANALYSIS
FTP1*	09/28/2000	SVOCs (TO-13)
FTP2*	09/28/2000	VOCs (TO-14)
Field Sample*	02/14/2001	Base Gases (GC) and VOCs & TPH (IR)
FTP3	11/26/2001	VOCs (TO-14)
FTP4	11/26/2001	SVOCs (TO-13)
Field Sample	11/26/2001	Base Gases (GC) and VOCs & TPH (IR)
FTP5	11/18/2003	VOCs (TO-14)
FTP6	11/18/2003	SVOCs (TO-13)
Field Sample	11/18/2003	Base Gases (GC)
FTP7	11/29/2005	VOCs (TO-14)
FTP8	11/29/2005	SVOCs (TO-13)
Field Sample	12/01/2005	Base Gases (GC)

* Results used as baseline data set.
GC: Gas chromatograph - field analysis of base gases made using an Agilent® G2890A micro GC
IR: Infrared - field analysis of VOCs and TPH made using a Foxboro Miran® IBX IR
SVOCs: semivolatile organic compounds
TO-13: Determination of polycyclic aromatic hydrocarbons in ambient air using GC/mass spectrometry (U.S. Environmental Protection Agency [EPA], 1999a)
TO-14: Determination of VOCs in ambient air using specially prepared canisters with subsequent analysis by GC (EPA, 1999b)
TPH: total petroleum hydrocarbons
VOCs: volatile organic compounds

Samples were collected from the soil gas monitoring well at a depth of 6.1 m (20 ft) below ground surface and were pumped from the sample depth directly into the sample containers. Summa canisters were used for the VOC and SVOC samples, and Tedlar® collection bags were used for the base gas samples. Ten times the volume of air contained in the sample tubing (between the sample location and the pump) was purged from the tubing before the samples were collected; therefore, the samples were considered to be representative of the soil gas at the sample location. Samples were collected according to the CR for CAU 342 (DOE/NV, 2000).

4.1.1 Field Screening Instruments

Base gas (oxygen, nitrogen, carbon dioxide, methane, and carbon monoxide) analysis was performed using an Agilent® G2890A micro GC. Calibration of the GC for oxygen, nitrogen, and carbon dioxide was performed against the atmosphere (20.5 percent oxygen, 78.5 percent nitrogen, and 0.037 percent carbon dioxide), and calibration for methane was done using a calibration gas containing 1.45 percent methane.

A Foxboro Miran® IBX IR instrument was used for the field screening of VOCs and TPH in 2001. Later, the IR instrument failed and could not be repaired; therefore, field screening for VOCs was not performed in 2003 or 2005. However, a soil gas sample was collected and submitted for offsite laboratory analysis of VOCs.

4.1.2 Sample Collection for Laboratory Analysis

Specially prepared Summa canisters were provided by the contract laboratory for collection of soil gas samples. These canisters arrived with the interior under vacuum. A stainless steel tube was lowered to collection depth in the well, and a pump pulled sufficient volume through the tube to fill it with soil gas. A canister was attached to the tube and filled with sample gas by opening the valve on the canister so that the vacuum pulled the sample into the canister. The samples were then shipped under chain of custody back to the laboratory for analysis. They did not require cooling or any other sample preservation.

4.2 SOIL GAS SAMPLE RESULTS

4.2.1 Base Gas Field Screening

Field screening results by GC for the base gases oxygen, nitrogen, carbon dioxide, methane, and carbon monoxide are presented in Table 2. The concentrations of nitrogen and oxygen in the soil gas collected during the initial sampling on February 14, 2001, were low compared to that of bulk atmosphere, and the concentration of carbon dioxide was roughly three times the concentration that naturally occurs in bulk atmosphere. Increased levels of carbon dioxide in soil gas and decreased levels of oxygen are an indication of biodegradation of TPH.

Results for oxygen, nitrogen, and carbon dioxide concentrations in soil gas samples collected on November 26, 2001, and on November 18, 2003, were at normal bulk atmospheric levels.

The concentrations of base gases in the soil gas collected on December 1, 2005, were similar to the initial concentrations collected on February 14, 2001. The concentration of oxygen in the soil gas was low, and the concentration of carbon dioxide in the soil gas was high compared to normal bulk atmospheric conditions. This is an indication that biodegradation of TPH is occurring in the soil.

Methane and carbon monoxide were not detected during field screening. Carbon monoxide is not expected, but methane is a possible decomposition product for biodegradation of TPH in wet soil.

TABLE 2. BASE GAS GC ANALYSIS RESULTS

GAS	NATURAL ABUNDANCE IN ATMOSPHERE (PERCENT)	RESULT (PERCENT)			
		02/14/2001*	11/26/2001	11/18/2003	12/01/2005
Oxygen	20.5	19.53	20.03	20.89	19.3
Nitrogen	78.5	75.20	76.72	77.96	79.1
Carbon Dioxide	0.037	0.111	0.032	0.035	0.448
Methane	--	ND	ND	ND	ND
Carbon Monoxide	--	ND	ND	ND	ND

*Baseline Data Set
ND: not detected at the instrument detection limit

4.2.2 Semivolatile Organic Compounds

Analytical results for SVOCs by Method TO-13 (EPA, 1999a) are presented in Table 3. The samples met all quality assurance (QA)/quality control (QC) requirements. Hold times, instrument QC, and associated QC sample results were all within acceptable limits.

No target SVOC analytes were found in any of the soil gas samples. The absence of SVOC analytes in the soil gas is not an absolute indication of their absence in the soil. They are, by definition, organic compounds that have a low vapor pressure. It is possible that they could occur at concentrations lower than the method detection limits of the laboratory analysis.

TABLE 3. SEMIVOLATILE ORGANIC COMPOUNDS LABORATORY ANALYTICAL RESULTS

ANALYTE	RESULT (MILLIGRAMS PER LITER)			
	09/28/2000*	11/26/2001	11/18/2003	11/29/2005
Pyridine	<0.00083	<0.00083	<0.00083	<0.00083
1,4-Dichlorobenzene	<0.00083	<0.00083	<0.00083	<0.00083
2-Methylphenol	<0.00083	<0.00083	<0.00083	<0.00083
3-Methylphenol & 4-Methylphenol	<0.0017	<0.0017	<0.0017	<0.0017
Hexachloroethane	<0.00083	<0.00083	<0.00083	<0.00083
Nitrobenzene	<0.00083	<0.00083	<0.00083	<0.00083
Hexachlorobutadiene	<0.00083	<0.00083	<0.00083	<0.00083
2,4,6-Trichlorophenol	<0.00083	<0.00083	<0.00083	<0.00083
2,4,5-Trichlorophenol	<0.00083	<0.00083	<0.00083	<0.00083
2,4-Dinitrotoluene	<0.00083	<0.00083	<0.00083	<0.00083
Hexachlorobenzene	<0.00083	<0.00083	<0.00083	<0.00083
Pentachlorophenol	<0.00083	<0.00083	<0.00083	<0.00083

*Baseline Data Set
< indicates that the compound was not detected at the laboratory method detection limit

4.2.3 Volatile Organic Compounds

Analytical results for VOCs by Method TO-14 (EPA, 1999b) are summarized in Table 5. As noted previously, field screening for VOCs by IR was discontinued after 2001 due to instrument failure. All QA/QC requirements were met by the laboratory; hold times, instrument QC, and associated QC sample results were all within acceptable limits.

The analytical results for VOCs indicate that several compounds were present at concentrations above the laboratory method detection limit; however, they are present at such low levels and so near the detection limit that their precise concentrations are difficult to quantify. The detection limit increased by three orders of magnitude since the 2003 analysis; therefore it is difficult to compare the current results to previous results. However, it can be said that the trend in overall VOC concentrations continues to remain below or near the method detection limit.

TABLE 4. VOLATILE ORGANIC COMPOUNDS LABORATORY ANALYTICAL RESULTS

ANALYTE	RESULT (PARTS PER MILLION)			
	09/28/2000*	11/26/2001	11/18/2003	11/29/2005
Vinyl Chloride	<1.5	<0.15	<0.0012	<0.13
Acetone	--	**0.16**	**0.0082**	<0.13
1,1-Dichloroethene	**2.2**	<0.15	<0.0012	**0.17**
Methylene Chloride	--	<0.15	<0.0012	<0.13
2-Butanone (MEK)	<1.5	<0.15	<0.0013	<0.13
Chloroform	<1.5	<0.15	<0.0012	<0.13
1,2-Dichloroethane	<1.5	<0.15	<0.0012	<0.13
1,1,1-Trichloroethane	**8.8**	0.16	**0.0019**	**0.30**
Benzene	<1.5	<0.15	<0.0012	<0.13
Carbon Tetrachloride	<1.5	<0.15	<0.0012	<0.13
Trichloroethene	<1.5	<0.15	<0.0011	<0.13
Toluene	--	**0.19**	**0.0013**	<0.13
Tetrachloroethene	<1.5	<0.15	<0.0012	<0.13
Chlorobenzene	<1.5	<0.15	<0.0012	**1.2**
Ethylbenzene	--	**0.16**	<0.0012	<0.13
m,p-Xylene	--	**1.0**	**0.0021**	**0.25**
o-Xylene	--	**9.6**	**0.042**	**2.1**
1,3,5-Trimethylbenzene	--	**7.4**	**0.036**	**1.2**
1,2,4-Trimethylbenzene	--	**0.41**	<0.0012	<0.13
1.4-Dichlorobenzene	<1.5	<0.15	<0.0012	<0.13
Hexachlorobutadiene	<1.5	<0.15	<0.0012	<0.13
Chloromethane	--	--	**0.0017**	<0.13
Vinyl Acetate	--	--	**0.0039**	<0.13
4-Ethyltoluene	--	--	**0.0035**	**1.2**

*Baseline Data Set
< indicates that the compound was not detected at the laboratory method detection limit
-- indicates that the compound was not reported as being present in laboratory results

5.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 SUMMARY

Visual inspections of the site were conducted to identify any significant changes that would require action. No concerns were observed, and the site was in excellent condition.

Soil gas samples were collected on November 29, 2005, for analysis of VOCs and SVOCs, and samples were collected on December 1, 2005, for analysis of base gases. In the base gas analysis, the concentration of oxygen was low and the concentration of carbon dioxide was high compared to that of bulk atmosphere. Increased levels of carbon dioxide in soil gas and decreased levels of oxygen are an indication of biodegradation of TPH.

In the analysis of organic compounds, SVOCs have not been detected above the method detection limits. The VOCs remain below or near method detection limits.

5.2 CONCLUSIONS

The site remains in excellent condition, and no issues were observed during the site inspections.

Soil gas sample results prove that the data are comparable from year to year and that biodegradation of TPH is occurring in the soil. There has been no significant change in concentrations of SVOCs and VOCs from the beginning of monitoring to the present. In the base gas analysis, the concentration of oxygen was low and the concentration of carbon dioxide was high compared to that of bulk atmosphere. Increased levels of carbon dioxide in soil gas and decreased levels of oxygen are an indication of biodegradation of TPH.

5.3 RECOMMENDATIONS

Post-closure monitoring was required for six years after closure of the site. Therefore, since 2005 was the sixth year of monitoring, the effectiveness of natural attenuation of the TPH-impacted soil by biodegradation was evaluated. According to the soil gas sample results, natural attenuation is decreasing TPH levels in the soil. Therefore, it is recommended that monitoring be discontinued.

To ensure that the signs are in place and readable and that the use restriction has been maintained at the site, it is recommended that biannual site inspections continue with the results reported in an annual letter report.

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6.0 REFERENCES

DOE/NV, see U.S. Department of Energy, Nevada Operations Office.

EPA, see U.S. Environmental Protection Agency.

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APPENDIX A

POST-CLOSURE INSPECTION FORMS AND PHOTOGRAPHS

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CAU 342: AREA 23 MERCURY FIRE TRAINING PIT
POST-CLOSURE INSPECTION FORM

Inspect the well and surrounding area. Look for any unusual change in the unit such as accumulation of water, chemical odors, deterioration of structures, etc. Refer to the previous inspection of the unit in order to identify any changes. Inspections should be completed after a problem is reported by a contractor, DOE, NDEP, ER or other BN employees. Post Closure Care inspections will be done twice a year.

GENERAL INFORMATION

1. Date of inspection: 5/20/04

2. Facility Manager (name and organization): Jeff Smith

3. Reason for inspection: Semi-annual: ✓ Problem Reported: ____ Unusual weather: ____
   Details (Name, organization and telephone number of person reporting problem): ____

4. Describe weather conditions over the past few weeks (high winds, precipitation, local flooding):
   Warm, dry, windy

MONITORING WELL AND GENERAL SITE CONDITION

5. Condition of monitoring well and cover (cracked, tilted): Good condition

6. Condition of fencing (breaks, tilted, damaged): Fence is in excellent condition

7. Condition of signs (missing signs, fading, damaged): Signs are in good condition

8. Signs of erosion indicating runoff or runon (into) the area that could impact the monitoring well?
   No ✓ Yes ____ If yes, explain: ____

CAU 342: AREA 23 MERCURY FIRE TRAINING PIT
POST-CLOSURE INSPECTION FORM (Continued)

AREA SURROUNDING WELL

9. Describe any significant changes in the general area (within several hundred feet of the unit) from the previous inspection. Changes can include water in the area, change in land use, storage of materials nearby, soil piles, change in use of the facility, etc. NONE

10. What is the (possible) effect of the change? NONE

11. Other comments or observations: The site is in excellent condition

12. Recommendations: Continue inspections as scheduled

13. Does the finding(s) of this inspection require another inspection prior to the scheduled ~~monthly~~ biannual inspection? No ✓ Yes ____ If yes, date of next inspection: ____

Significant changes noted must be notified to the Project Manager and Task Manager upon return to the office.

Inspected by : Alissa Tibesar Signed: [signature] Date: 5/20/04

Names of other persons on inspection (print):

Kevin Campbell

CAU 342: AREA 23 MERCURY FIRE TRAINING PIT
POST-CLOSURE INSPECTION FORM

Inspect the well and surrounding area. Look for any unusual change in the unit such as accumulation of water, chemical odors, deterioration of structures, etc. Refer to the previous inspection of the unit in order to identify any changes. Inspections should be completed after a problem is reported by a contractor, DOE, NDEP, ER or other BN employees. Post Closure Care inspections will be done twice a year.

GENERAL INFORMATION

1. Date of inspection: 11/14/04

2. Facility Manager (name and organization): Jeff Smith

3. Reason for inspection: Semi-annual: ✓ Problem Reported: ____ Unusual weather: ____
   Details (Name, organization and telephone number of person reporting problem): ____

4. Describe weather conditions over the past few weeks (high winds, precipitation, local flooding):
   Cold, dry, scattered high clouds

MONITORING WELL AND GENERAL SITE CONDITION

5. Condition of monitoring well and cover (cracked, tilted): Good condition slight crack in concrete cover, lid/well plug securely sealed well

6. Condition of fencing (breaks, tilted, damaged): Excellent - no breaks or downed areas.

7. Condition of signs (missing signs, fading, damaged): All use restriction warning signs present and legible

8. Signs of erosion indicating runoff or runon (into) the area that could impact the monitoring well?
   No X Yes ____ If yes, explain: ____

CAU 342: AREA 23 MERCURY FIRE TRAINING PIT
POST-CLOSURE INSPECTION FORM (Continued)

AREA SURROUNDING WELL

9. Describe any significant changes in the general area (within several hundred feet of the unit) from the previous inspection. Changes can include water in the area, change in land use, storage of materials nearby, soil piles, change in use of the facility, etc. None

10. What is the (possible) effect of the change? None

11. Other comments or observations: Overall site condition is excellent.

12. Recommendations: Continue scheduled inspections.

13. Does the finding(s) of this inspection require another inspection prior to the scheduled monthly inspection? No X Yes ____ If yes, date of next inspection: ____

Significant changes noted must be notified to the Project Manager and Task Manager upon return to the office.

Inspected by : Kevin Campbell Signed: Kevin Campbell Date: 11/14/04

Names of other persons on inspection (print):

N/A N/A N/A

CAU 342: AREA 23 MERCURY FIRE TRAINING PIT
POST-CLOSURE INSPECTION FORM

Inspect the well and surrounding area. Look for any unusual change in the unit such as accumulation of water, chemical odors, deterioration of structures, etc. Refer to the previous inspection of the unit in order to identify any changes. Inspections should be completed after a problem is reported by a contractor, DOE, NDEP, ER or other BN employees. Post Closure Care inspections will be done twice a year.

GENERAL INFORMATION

1. Date of inspection: 5/17/05

2. Facility Manager (name and organization): Jeff Smith

3. Reason for inspection: Semi-annual: ✓ Problem Reported: ____ Unusual weather: ____
   Details (Name, organization and telephone number of person reporting problem): ____

4. Describe weather conditions over the past few weeks (high winds, precipitation, local flooding):
   cool, clear, breezy

MONITORING WELL AND GENERAL SITE CONDITION

5. Condition of monitoring well and cover (cracked, tilted): Monitoring well & cover in good condition

6. Condition of fencing (breaks, tilted, damaged): Good condition

7. Condition of signs (missing signs, fading, damaged): Good condition

8. Signs of erosion indicating runoff or runon (into) the area that could impact the monitoring well?
   No ✓ Yes ____ If yes, explain: ____

CAU 342: AREA 23 MERCURY FIRE TRAINING PIT
POST-CLOSURE INSPECTION FORM (Continued)

AREA SURROUNDING WELL

9. Describe any significant changes in the general area (within several hundred feet of the unit) from the previous inspection. Changes can include water in the area, change in land use, storage of materials nearby, soil piles, change in use of the facility, etc. none

10. What is the (possible) effect of the change? none

11. Other comments or observations: No issues or concerns

12. Recommendations: Continue inspections as scheduled.

13. Does the finding(s) of this inspection require another inspection prior to the scheduled ~~monthly~~ biannual inspection? No ✓ Yes ____ If yes, date of next inspection: ____

Significant changes noted must be notified to the Project Manager and Task Manager upon return to the office.

Inspected by : Alissa Siwas Signed: [signature] Date: 5/17/05

Names of other persons on inspection (print):

Shaughn Burnison

CAU 342: AREA 23 MERCURY FIRE TRAINING PIT
POST-CLOSURE INSPECTION FORM

Inspect the well and surrounding area. Look for any unusual change in the unit such as accumulation of water, chemical odors, deterioration of structures, etc. Refer to the previous inspection of the unit in order to identify any changes. Inspections should be completed after a problem is reported by a contractor, DOE, NDEP, ER or other BN employees. Post Closure Care inspections will be done twice a year.

GENERAL INFORMATION

1. Date of inspection: 11/15/05

2. Facility Manager (name and organization): Jeff Smith

3. Reason for inspection: Semi-annual: ✓ Problem Reported: ____ Unusual weather: ____
   Details (Name, organization and telephone number of person reporting problem): ____

4. Describe weather conditions over the past few weeks (high winds, precipitation, local flooding):
   Cool, clear, high clouds

MONITORING WELL AND GENERAL SITE CONDITION

5. Condition of monitoring well and cover (cracked, tilted): good condition, slight crack in concrete cover. Well plug in excellent condition with tight seal

6. Condition of fencing (breaks, tilted, damaged): Excellent condition. No downed areas or breaks

7. Condition of signs (missing signs, fading, damaged): All use restriction signs are present and in excellent condition.

8. Signs of erosion indicating runoff or runon (into) the area that could impact the monitoring well?
   No ✓ Yes ____ If yes, explain: ____

CAU 342: AREA 23 MERCURY FIRE TRAINING PIT
POST-CLOSURE INSPECTION FORM (Continued)

AREA SURROUNDING WELL

9. Describe any significant changes in the general area (within several hundred feet of the unit) from the previous inspection. Changes can include water in the area, change in land use, storage of materials nearby, soil piles, change in use of the facility, etc. None

10. What is the (possible) effect of the change? None

11. Other comments or observations: Overall condition of site is excellent.

12. Recommendations: Continue inspections as scheduled

13. Does the finding(s) of this inspection require another inspection prior to the scheduled ~~monthly~~ semi-annual inspection? No X Yes ____ If yes, date of next inspection: ____

Significant changes noted must be notified to the Project Manager and Task Manager upon return to the office.

Inspected by : Kevin Campbell Signed: Kevin Campbell Date: 11/15/05

Names of other persons on inspection (print):

NA NA NA

PHOTOGRAPH LOG

PHOTOGRAPH NUMBER	DATE	PERSPECTIVE	DESCRIPTION
1	05/20/2004	Facing North	CAU 342, Former Aboveground Storage Tank Area
2	05/20/2004	Looking Down	CAU 342, Soil Gas Monitoring Well
3	11/14/2004	Facing North	CAU 342, Former Aboveground Storage Tank Area
4	11/14/2004	Looking Down	CAU 342, Soil Gas Monitoring Well
5	05/17/2005	Facing North	CAU 342, Former Aboveground Storage Tank Area
6	05/17/2005	Looking Down	CAU 342, Soil Gas Monitoring Well
7	11/15/2005	Facing North	CAU 342, Former Aboveground Storage Tank Area
8	11/15/2005	Looking Down	CAU 342, Soil Gas Monitoring Well

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Photograph 1: CAU 342, Former Aboveground Storage Tank Area, Facing North, 05/20/2004

Photograph 2: CAU 342, Soil Gas Monitoring Well, 05/20/2004

Photograph 3: CAU 342, Former Aboveground Storage Tank Area, Facing North, 11/14/2004

Photograph 4: CAU 342, Soil Gas Monitoring Well, 11/14/2004

Photograph 5: CAU 342, Former Aboveground Storage Tank Area, Facing North, 05/17/2005

Photograph 6: CAU 342, Soil Gas Monitoring Well, 05/17/2005

Photograph 7: CAU 342, Former Aboveground Storage Tank Area, Facing North, 11/15/2005

Photograph 8: CAU 342, Soil Gas Monitoring Well, 11/15/2005

APPENDIX B

MONITORING DATA

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Bechtel Nevada

ANALYTICAL LABORATORY

SERVICES REQUEST AND CHAIN OF CUSTODY RECORD

Page 1 of 1

PROJECT / CLIENT INFORMATION

ct: CAU342 Fire Training Pit | BN Org#: B502

ge Number:

ct Manager: Jeffery Smith

e: 295-3229 | Fax: 295-6671 | M/S: NTS306

REPORT & TURNAROUND INFORMATION

Send Report to: Kevin Campbell

Phone: 295-6087 | Fax: 295-6671 | M/S: NTS306

Turnaround: (X) Standard – 14 days IH, 28 days Non-rad Env, 45 days Rad Env
( ) RUSH Preliminary by: _____ (IH)
__1 __2 __7 __14 (non-Rad Env)
__1 __7 __14 __28 (Radiological Env)

SAMPLE INFORMATION

Sampling Site: CAU342 Fire Traing Pit

The samples submitted contain (check);

( ) **Hazardous** - *(list)* _____

( ) **Radioactive** - *(list)* _____

(X) **Unknown** contamination. If known, identify contaminants. This information will ensure compliance with applicable regulations and allow for the safe handling of the sample materials.

SAMPLE MANAGEMENT INFORMATION

: _____ (IH) V2591 (Non-Rad Env) _____ (Rad Env)

COPY

ples submitted are associated with a signed Project SOW. (X) YES ( ) NO

lyses entered here agree with the SOW. (X) YES ( ) NO ( ) N/A

ot, identify the variation: _____

contract Lab(s) used for this work: SOUTHWEST RESEARCH VIA LIONVILLE

ESCRIPTION	SAMPLING DATE	SAMPLING TIME	MATRIX	CONTAINER #	CONTAINER Est. Vol	QC MD	QC MS	QC MSD	Pres – Analysis eg. HCl - VOCs	Pay Item, Analysis, Method: T014 VOC	T013 SVOC						
FTP7	11/29/05	0854	Air	1					None	X							
FTP8	11/29/05	0900	Air	1					None		X						
			Test	Line													

STODY TRANSFER

bled/Relinquished (print)	Signature	DATE / TIME	Received by (print)	Signature	DATE / TIME
evin Campbell	Kevin Campbell BNER	11/29/05@1319	CD CASTANEDA	CD Castaneda	11/29/05@1319

Retention Code: ENV 5.c(1)

BN-0732 (04/02)

SOUTHWEST RESEARCH INSTITUTE

TO-14 Air Analysis Data Reporting Form

Sample I.D.: FTP7
Case No.: Bech. Nevada
Lab Filename: C121203
SwRI I.D.: 270560
Client: Lionville Laboratory, Inc.

Date Analyzed: Dec 12 2005 11:27AM
Date Sample Received: Dec 1 2005 8:30AM
Project Number: 11817.02.004
Injection Dilution: 100
Sample Dilution: 1.27

This sample was diluted with clean nitrogen. The canister pressure change was from -1.5 PSI to 2.0 PSI.

Volume Injected (mL): 5 Atmospheric Pressure (in Hg): 29.15 Room Temperature (C): 24

CAS No.	Compound	ppb (v/v)
115-07-1	PROPENE	130 U
75-71-8	DICHLORODIFLUOROMETHANE	130 U
74-87-3	CHLOROMETHANE	130 U
76-14-2	DICHLOROTETRAFLUOROETHANE	130 U
75-01-4	VINYL CHLORIDE	130 U
106-99-0	1,3-BUTADIENE	130 U
74-83-9	BROMOMETHANE	130 U
75-00-3	CHLOROETHANE	130 U
67-64-1	ACETONE	130 U
75-69-4	TRICHLOROFLUOROMETHANE (R11)	130 U
75-35-4	***1,1-DICHLOROETHENE***	***170***
75-09-2	METHYLENE CHLORIDE	130 U
76-13-1	1,1,2-TRICHLOROTRIFLUOROETHANE	130 U
75-15-0	CARBON DISULFIDE	130 U
156-60-5	trans-1,2-DICHLOROETHENE	130 U
75-34-3	1,1-DICHLOROETHANE	130 U
108-05-4	VINYL ACETATE	130 U
78-93-3	2-BUTANONE	130 U
156-59-2	cis-1,2-DICHLOROETHENE	130 U
141-78-6	ETHYL ACETATE	130 U
110-54-3	HEXANE	130 U
67-66-3	CHLOROFORM	130 U
107-06-2	1,2-DICHLOROETHANE	130 U
71-55-6	***1,1,1-TRICHLOROETHANE***	***300***
71-43-2	BENZENE	130 U
56-23-5	CARBON TETRACHLORIDE	130 U
78-87-5	1,2-DICHLOROPROPANE	130 U
75-27-4	BROMODICHLOROMETHANE	130 U
79-01-6	TRICHLOROETHENE	130 U
142-82-5	HEPTANE	130 U
108-10-1	4-METHYL-2-PENTANONE	130 U
10061-01-5	cis-1,3-DICHLOROPROPENE	130 U
10061-02-6	trans-1,3-DICHLOROPROPENE	130 U
79-00-5	1,1,2-TRICHLOROETHANE	130 U
108-88-3	TOLUENE	130 U
591-78-6	2-HEXANONE	130 U
124-48-1	DIBROMOCHLOROMETHANE	130 U
106-93-4	1,2-DIBROMOETHANE	130 U
127-18-4	TETRACHLOROETHENE	130 U

DATA REPORTING QUALIFIERS

- B This flag is used when the analyte is found in the blank as well as the sample.
- E This flag indicates compounds whose concentrations exceed the calibration range.
- J Indicates an estimated value.
- U Indicates compound was analyzed for, but not detected. Report the minimum detection limit for the sample with U (e.g. 10U) based on necessary concentration dilution action (This is not necessarily the instrument detection limit).

SOUTHWEST RESEARCH INSTITUTE

TO-14 Air Analysis Data Reporting Form

Sample I.D.: FTP7
Case No.: Bech. Nevada
Lab Filename: C121203
SwRI I.D.: 270560
Client: Lionville Laboratory, Inc.

Date Analyzed: Dec 12 2005 11:27AM
Date Sample Received: Dec 1 2005 8:30AM
Project Number: 11817.02.004
Injection Dilution: 100
Sample Dilution: 1.27

This sample was diluted with clean nitrogen. The canister pressure change was from -1.5 PSI to 2.0 PSI.

Volume Injected (mL): 5 Atmospheric Pressure (in Hg): 29.15 Room Temperature (C): 24

CAS No.	Compound	ppb (v/v)
108-90-7	***CHLOROBENZENE***	***1200***
100-41-4	ETHYLBENZENE	130 U
	M/P-XYLENE	***250***
75-25-2	BROMOFORM	130 U
100-42-5	STYRENE	130 U
79-34-5	***1,1,2,2-TETRACHLOROETHANE***	***700***
95-47-6	***O-XYLENE***	***2100***
622-96-8	***4-ETHYLTOLUENE***	***1200***
108-67-8	***1,3,5-TRIMETHYLBENZENE***	***1200***
95-63-6	1,2,4-TRIMETHYLBENZENE	130 U
100-44-7	BENZYL CHLORIDE	130 U
541-73-1	1,3-DICHLOROBENZENE	130 U
106-46-7	1,4-DICHLOROBENZENE	130 U
95-50-1	1,2-DICHLOROBENZENE	130 U
120-82-1	1,2,4-TRICHLOROBENZENE	130 U
87-68-3	HEXACHLOROBUTADIENE	130 U

DATA REPORTING QUALIFIERS

B This flag is used when the analyte is found in the blank as well as the sample.
E This flag indicates compounds whose concentrations exceed the calibration range.
J Indicates an estimated value.
U Indicates compound was analyzed for, but not detected. Report the minimum detection limit for the sample with U (e.g. 10U) based on necessary concentration dilution action (This is not necessarily the instrument detection limit).

SOUTHWEST RESEARCH INSTITUTE

TO-14 Air Analysis Data Reporting Form

Sample I.D.: FTP7
Case No.: Bech. Nevada
Lab Filename: C121203
SwRI I.D.: 270560
Client: Lionville Laboratory, Inc.

Date Analyzed: Dec 12 2005 11:27AM
Date Sample Received: Dec 1 2005 8:30AM
Project Number: 11817.02.004
Injection Dilution: 100
Sample Dilution: 1.27

This sample was diluted with clean nitrogen. The canister pressure change was from -1.5 PSI to 2.0 PSI.

Volume Injected (mL): 5

Atmospheric Pressure (in Hg): 29.15

Room Temperature (C): 24

Additional Identified Compounds

CAS No.	Compound	Retention Time	Estimated ppb (v/v)	
96-37-7	CYCLOPENTANE, METHYL-	10.96	750	NJ
565-59-3	PENTANE, 2,3-DIMETHYL-	12.08	440	NJ
589-34-4	HEXANE, 3-METHYL-	12.21	920	NJ
2453-00-1	CYCLOPENTANE, 1,3-DIMETHYL-	12.57	710	NJ
2453-00-1	CYCLOPENTANE, 1,3-DIMETHYL-	12.66	710	NJ
872-56-0	ISOPROPYLCYCLOBUTANE	12.73	1100	NJ
108-87-2	CYCLOHEXANE, METHYL-	13.78	9300	NJ
1640-89-7	CYCLOPENTANE, ETHYL-	14.03	750	NJ
2815-58-9	CYCLOPENTANE, 1,2,4-TRIMETHYL-	14.20	1400	NJ
15890-40-1	CYCLOPENTANE, 1,2,3-TRIMETHYL-, (1	14.42	560	NJ
638-04-0	CYCLOHEXANE, 1,3-DIMETHYL-, CIS-	15.33	2100	NJ
6876-23-9	CYCLOHEXANE, 1,2-DIMETHYL-, TRANS-	15.64	800	NJ
583-57-3	CYCLOHEXANE, 1,2-DIMETHYL-	15.94	1100	NJ
2207-03-6	CYCLOHEXANE, 1,3-DIMETHYL-, TRANS-	16.08	480	NJ
3073-66-3	CYCLOHEXANE, 1,1,3-TRIMETHYL-	16.92	1200	NJ
1839-63-0	CYCLOHEXANE, 1,3,5-TRIMETHYL-	17.25	360	NJ
694-72-4	PENTALENE, OCTAHYDRO-	17.68	380	NJ
3728-56-1	1-ETHYL-4-METHYLCYCLOHEXANE	17.95	670	NJ
4926-78-7	CYCLOHEXANE, 1-ETHYL-4-METHYL-, CI	18.01	360	NJ
1678-92-8	CYCLOHEXANE, PROPYL-	18.76	570	NJ

J Indicates an estimated value, where a 1:1 response is assumed.
N Indicates presumptive evidence of a compound.
B This flag is used when the analyte is found in the blank as well as a sample.

SOUTHWEST RESEARCH INSTITUTE

RCRA Semivolatile Organics (Modified Method TO13) Data Reporting Form

Client: Lionville Laboratory, Inc.
Case: Bech. Nevada
SDG: 270560
Matrix: AIR
Sample Volume (L): 6.0
Level: LOW
GPC Cleanup: N

Client Sample ID: FTP8
System ID: 270561
Filename: 61228507
pH: N/A
Concentrated Extract Volume (uL): 1000
% Moisture: 0
Decanted: N

Project Number: 11817.02.004
Instrument: FINN6
Date Received: Dec 1 2005 8:30AM
Date Extracted: Dec 06, 2005
Date Analyzed: Dec 28 2005 6:28PM
Dilution Factor: 1
Injection Volume (uL): 2.0

CAS No.	Compound	mg/L
110-86-1	PYRIDINE	0.00083 U
106-46-7	1,4-DICHLOROBENZENE	0.00083 U
95-48-7	2-METHYLPHENOL	0.00083 U
106-44-5	4-METHYLPHENOL	0.00083 U
67-72-1	HEXACHLOROETHANE	0.00083 U
98-95-3	NITROBENZENE	0.00083 U
87-68-3	HEXACHLOROBUTADIENE	0.00083 U
88-06-2	2,4,6-TRICHLOROPHENOL	0.00083 U
95-95-4	2,4,5-TRICHLOROPHENOL	0.00083 U
121-14-2	2,4-DINITROTOLUENE	0.00083 U
118-74-1	HEXACHLOROBENZENE	0.00083 U
87-86-5	PENTACHLOROPHENOL	0.00083 U

DATA REPORTING QUALIFIERS

- B This flag is used when the analyte is found in the blank as well as the sample.
- D Concentration value is from dilution analysis.
- E This flag indicates compounds whose concentrations exceed the calibration range.
- J Indicates an estimated value.
- U Indicates compound was analyzed for, but not detected. Report the minimum detection limit for the sample with U (e.g. 10U) based on necessary concentration dilution action (This is not necessarily the instrument detection limit).

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